

US Army Corps  
of Engineers  
Missouri River Division

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# MISSOURI RIVER

## Special Point-Integrated Sediment Sampling Report

MRD Sediment Series  
Number 37  
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## **I INTRODUCTION**

### **Purpose:**

In 1976, the Missouri River Division of the US Army Corps of Engineers authorized the Omaha District to modify its sediment sampling program to include periodic detailed bed material load measurements on the Missouri River. The purpose of this report is to provide a summary display of the special point sampling data obtained under this directive from 1976 to 1986 on the Missouri River at Sioux City, Omaha, and Nebraska City.

Reasonably accurate estimates of bed material loads were needed a) to support studies of degradation problems below Gavins Point Dam, b) to define the balance of sediment load between Omaha, Nebraska City, and the Platte River at Louisville, c) to aid evaluations of the adequacy of several well known sediment transport functions, d) to permit a rational basis for adjusting the routinely collected depth-integrated samples so the amount of bed size materials in suspension can be accurately determined, e) to permit development of a sediment rating curve and an annual load for the bed material particles found in suspension, and f) to assist an evaluation of the effects of discharge and temperature on bed configuration.

Experience has shown that several years of data collection are required to represent the stochastic nature of bed material transport. As the bed material of the Missouri River coarsens, and the river continues to degrade, new issues regarding the operation and maintenance of Corps' projects will unfold. This data will be essential in the evaluation of these and other issues.

### **Scope:**

The U.S. Geological Survey, under a cooperative stream gaging program with the Corps, has collected bed material and suspended sediment samples since 1976 at two locations on the Missouri River: Omaha, Nebraska, and Nebraska City, Nebraska. They have collected data at Sioux City, Iowa since 1979. Data collected include five to seven point integrated samples per stream vertical at five vertical locations in the cross-section and one bed sample at each vertical. Each station was sampled by boat at about six week intervals during the open water season. Figure 1 shows the location of the sampling sites.

In addition to the sediment data, velocity measurements, discharge measurements, water surface elevation and slope, sonic

soundings, and temperature data were collected at each station. Laboratory analyses of the sediment were conducted and recorded. Point-integrated sediment data was processed using the FORTRAN program ODSET to compute the sediment load for each cross section.

This report makes no attempt to interpret the sediment data. Rather, the data is presented for use in the aforementioned studies. A summary of the sampling techniques and data analysis are provided for the reader. Only summary output from the ODSET program is published herein, but raw concentration and velocity data is available.

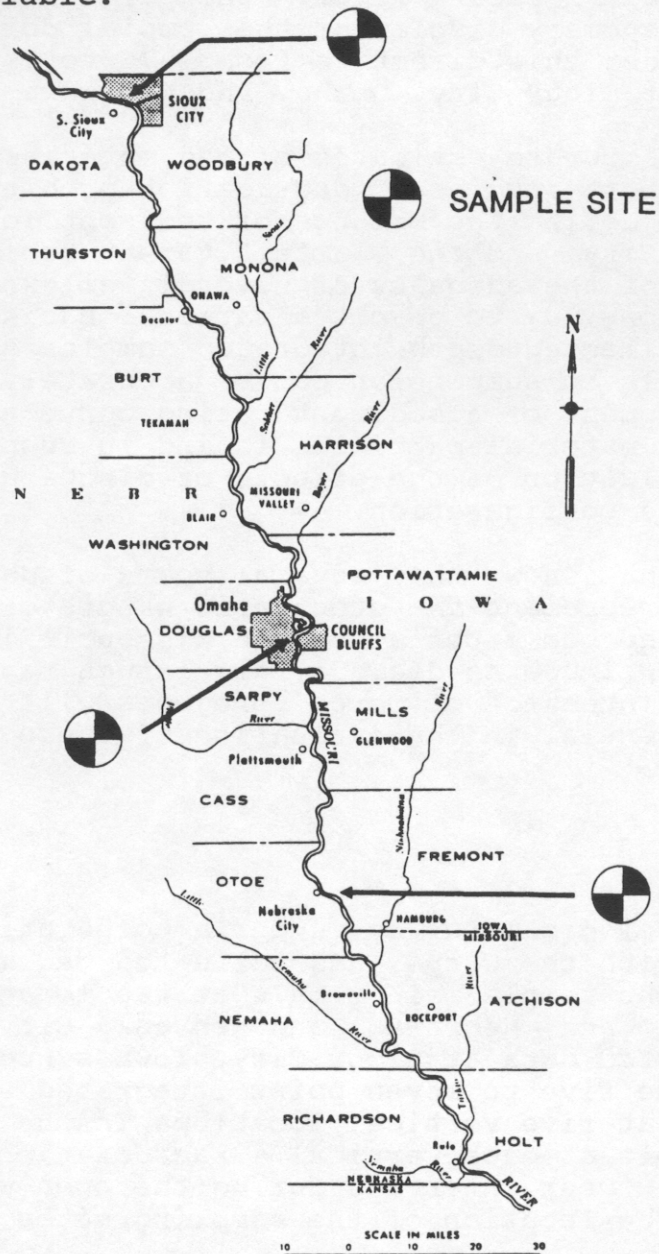


Figure 1 - Sampling Locations